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| 09/800,397 | 03/05/2001 | Alok Sharma | 0023-0135 | 2689 |
| 44987 7590 06/06/2008 HARRITY SNYDER, LLP 11350 Random Hills Road SUITE 600 FAIRFAX, VA 22030 | | | | |
| EXAMINER | | | | |
| ZHONG, JUN FEI | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/800,397

Applicant(s)

SHARMA, ALOK

Examiner

JUN FEI ZHONG

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-10,12-17 and 22-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-10,12-17 and 22-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2008 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Response to Amendment

1. This action is responsive to an Amendment filed 3/14/2008. Claims 1, 3-10, 12-17, and 22-40 are pending. Claims 1, 3-5, 8, 16, 22-27, 36-38 are amended.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 3-10, 12-17, and 22-40 have been considered but are moot in view of the new ground(s) of rejection.

Although a new ground of rejection has been used, a response is considered necessary for several of applicant's arguments since Barham and English references will continue to be used to meet claimed limitations.

Applicant argues Barham and English do not disclose or reasonably suggest maintaining pre-computed sets of filter coefficients in non-volatile storage, each set corresponding to one of the plurality of low-pass digital filters, each filter having one of a predetermined set of bandwidths, as recited in amended claim 1.

However, the examiner respectfully disagrees. Barham teaches plurality of demodulators 10, each demodulator 10 includes reconfigurable FIR filter 14 (i.e., multiple FIR filters in Barham's system) (see col. 4, line 11-col. 6, line 63; Fig. 1b and 18). English discloses coefficient register 44 for holding a set of FIR coefficients (see col. 3, lines 47-50; Fig. 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have coefficients storage as taught by English to the multiple FIR filter of Barham in order to provide a subcarrier signal

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generator at relatively lesser expense, yet compensate for frequency-dependent characteristics and provide a high quality subcarrier signal.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The abstract of the disclosure is objected to because the abstract is more than 150 words. Correction is required. See MPEP § 608.01(b).

Drawings

5. The drawings are objected to because "915-3" in Fig. 9 should be "915-1"; "AQM-16" in Fig. 12 should be "QAM-16". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as

"amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1, 3-10, 12-17, and 22-40 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 3-4, 8, 16-17, 22-26 and 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barham et al. (Patent # US 6721371 B1) in view of English (Patent # US 5489879).

As to claim 1, Barham discloses a method for provisioning multiple digital receivers, comprising:

providing an analog to digital converter (e.g., analog to digital converter 102; Fig. 18) having an analog input and a digital output (see col. 3, lines 50-56);

providing a plurality of digital receivers (e.g., demodulators 10), each receiver having a programmable center frequency (e.g., reconfigurable FIR filter center frequencies) (see col. 6, lines 56-63),

where the plurality of digital receivers are configured to receive digitized samples from the analog to digital converter and where each of the plurality of digital receivers includes a low-pass digital filter (e.g., the digitized samples are coupled to each demodulators 10 through demultiplexer 103; each demodulator 10 includes reconfigurable FIR filter 14; Fig. 1b, 18) (see col. 5, lines 49-60; col. 6, lines 56-63);

each set corresponding to one of the plurality of low-pass digital filters, each filter having one of a predetermined set of bandwidths (e.g., reconfigurable FIR filter 14) (see col. 4, line 11 through col. 6, line 63);

Barham does not specifically disclose store filter coefficients in storage.

In a analogous art, English discloses maintaining pre-computed sets of filter coefficients in non-volatile storage (e.g., coefficient register 44; Fig. 2) (see col. 3, lines 47-50),

receiving a request to provision a selected one of the plurality of digital receivers (e.g., receive pointer information; pointer 124 points to a demodulator) (see col. 4, line 58-col. 5, line 9; Fig. 19);

selecting a first center frequency and first bandpass bandwidth for provisioning the selected one of the plurality of demodulators digital receivers (e.g., selecting bandpass bandwidth for FIR filter);

retrieving the filter coefficients associated with the first bandpass bandwidth (e.g., locating coefficients for desired shape and center frequency for filter) (see col. 3, lines 42-57);

subjecting the retrieved filter coefficients to a bandpass transformation corresponding to the first center frequency (e.g., modifies FIR coefficients) (see col. 4, lines 27-37);

loading the transformed filter coefficients into coefficient latches in the selected one of the plurality of digital receivers (e.g., loading a set of coefficients to FIR filter) (see col. 4, lines 37-43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have coefficients storage as taught by English to the FIR filter of Barham in order to provide a subcarrier signal generator at relatively lesser expense, yet compensate for frequency-dependent characteristics and provide a high quality subcarrier signal.

As to claim 3, Barham discloses the method of claim 1, further including:

reconfigurable FIR filter (see col. 4, line 11 through col. 6, line 63);

English discloses operating the selected one of the plurality of digital receivers at the first center frequency (e.g., desired FIR coefficients);

subsequent to said operating, loading the coefficient latches in the selected one of the plurality of digital receivers with transformed coefficients corresponding to a second center frequency (e.g., modified FIR coefficients); and

operating the selected one of the plurality of digital receivers at the second center frequency (e.g., loading modified FIR coefficients to FIR filter) (see col. 4, lines 27-56).

As to claim 4, Barham discloses the method of claim 3, further including:

reconfigurable FIR filter (see col. 4, line 11 through col. 6, line 63);

English discloses selecting a second center frequency and second bandpass bandwidth for provisioning a second one of the plurality of digital receivers, wherein said first and second bandpass bandwidths are unequal (e.g., desired FIR coefficients and modified FIR coefficients are not the same);

retrieving the filter coefficients associated with the second bandwidth;
subjecting the retrieved filter coefficients to a bandpass transformation
corresponding to the second center frequency; and
loading the transformed coefficients into coefficient latches in the second one of
the plurality of digital receivers (e.g., loading modified FIR coefficients to FIR filter) (see
col. 4, lines 27-56).

As to claim 8, Barham discloses the method of claim 1, wherein the analog to
digital converter, the plurality of digital receivers, and the non-volatile storage (e.g.,
registers or memory) are implemented on a single integrated circuit (e.g., bank or array
of IC demodulators 10) (see col. 3, lines 53-55; col. 4, lines 45-50; col. 5, lines 49-57).

As to claim 16, Barham discloses the method of claim 1, wherein each of the
plurality of digital receivers includes a finite impulse response (FIR) digital filter (see col.
3, lines 51-55; col.5, lines 49-52).

As to claim 17, the method of claim 16, wherein each FIR filter is an Optimum
Equiripple Linear-Phase filter (i.e., this is a matter of design choice as known to those
ordinary skill in the art of filter design).

As to claims 22-23, the claimed number of the filter coefficients for each filter is at
least 16 (claim 22) and is at most 24 (claim 23) is also a matter of design choice, which

is well known to those of ordinary skill in the art of filter design, in addition to, as is well known in the art, tradeoffs must be made between passband ripple (less is better), stopband attenuation (more is better), for a fixed number of coefficients. Therefore, the number of coefficients selected by the inventor or designer is relative to the type of tradeoff benefits the designer would like to gain or lose as described above.

As to claims 24-26 and 36-40, the claims are met by the rejection of claims 1, 3-4, 8, 16-17 and 22-23, as described above

10. Claims 5-7, 13, 27-29 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barham et al. (Patent # US 6721371 B1) in view of English (Patent # US 5489879), and further in view of Quigley et al. (Patent # US 6650624).

As to claim 5, note the discussion above, Barham discloses a high speed demodulator system (see col. 4, line 11 through col. 6, line 63).

Both Barham and English fail to disclose CMTS.

Quigley discloses a CMTS channel bank organized into upstream and downstream channels (e.g., a plurality of demodulators 700a-700n, which receive modulated data input from a plurality of cable modems via a common transmission medium. The demodulators 700a-700n provide a demodulated data output for the frequency division multiplexed (FDM) upstream channels via which data is transmitted from the plurality of cable modems to the CMTS) (see col. 37, lines 29-45; Fig. 26).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the CMTS as taught by Quigley to the FIR filter of Barham as modified by English in order to enhance the data rate and/or reliability of upstream communications (see col. 3 lines 29-32).

As to claim 6, the claimed ratio of the number of upstream channels demodulated by the CMTS channel bank to a number of upstream input connectors of the CMTS channel bank is M (i.e., this is a matter of design choice as appreciated by one of ordinary skill in the art in the design of CMTS architecture).

As to claim 7, the claimed method of claim 6, wherein M is 16 is rejected on the same grounds as claim 6, since the claim has similar scope as claim 6.

As to claim 13, the claimed CMTS is DOCSIS compatible (i.e., it is well known in the art of cable modem technology that a CMTS is DOCSIS compatible).

As to claims 27-29 and 33, the claims are met by the rejection of claims 5-7 and 13, as described above.

11. Claims 14-15 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barham et al. (Patent # US 6721371 B1) in view of English (Patent # US 5489879), and further in view of Peyrovian (Patent # US 768682).

As to claim 14, note the discussion above, Barham discloses a high speed demodulator system (see col. 4, line 11 through col. 6, line 63).

Both Barham and English fail to disclose upstream channels are in the 750-1000 MHz, which is well known to those of ordinary skill in the art of transmitting data over cable service.

Peyrovian discloses the upstream channels are in the 750- 1000 MHz portion of the spectrum (see col. 3, lines 38-53)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the 750-1000 MHz portion of the spectrum as taught by Peyrovian to the FIR filter of Barham as modified by English because the high frequency band is typically much less susceptible to noise than the low frequency band that has traditionally been employed to carry the upstream information. Further, the frequency band of 750-1000 MHz has a much greater bandwidth than the low frequency band (see col. 3 lines 38-53).

As to claim 15, regarding the claimed at least one frequency stacker is used to densely pack each sub-band of the 750-1000 MHz spectrum portion (Official Notice is taking that it is well known in the art of data transmission over cable service to densely pack each sub-band of a given radio frequency (RF) spectrum portion (i.e. 750-1000 MHz) using at least one frequency stacker, for the advantage of efficiently using each sub-band in the given frequency spectrum so that the maximum amount of sub-bands in the spectrum may be used for sending data over the cable line. Therefore, it is

submitted that it would have been clearly obvious to one of ordinary skill in the art at the time of the invention to have used at least one frequency stacker to densely pack each sub-band of the 750-1000 MHz spectrum portion for the advantage given above).

As to claims 34-35, the claims are met by the rejection of claims 14-15, as described above.

12. Claims 9-10, 12, and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barham et al. (Patent # US 6721371 B1) in view of English (Patent # US 5489879), further in view of Quigley et al. (Patent # US 6650624), and in further view of the Applicant's admitted prior art in Fig. 17(A).

As to claim 9, the claimed CMTS channel bank is organized using a plurality of modules, each module having a plurality of downstream channels and a plurality of upstream channels is met by the admitted prior art Fig. 17(A), that discloses a CMTS channel bank with a module of downstream connectors for channels and 16 upstream connectors for channels and there are 8 modules in the bank, which directly corresponds to the claimed features. The claimed features are not patentable in view of the disclosure of the admitted prior art.

As to claim 10, the claimed number of the upstream channels is 4 times a number of the downstream channels is met by admitted prior art Fig. 17(A), that

discloses a CMTS channel bank with a module of 16 upstream connectors for channels and 4 downstream connectors for channels and there are 8 modules in the bank, which directly corresponds to the claimed features. The claimed features are not patentable in view of the disclosure of the admitted prior art.

As to claim 12, the claimed CMTS channel bank has 4 times as many upstream channels as downstream channels is met by admitted prior art Fig. 17(A), that discloses a 32 downstream by 128 upstream CMTS channel bank, which directly corresponds to the claimed feature. The claimed feature is not patentable in view of the disclosure of the admitted prior art.

As to claims 30-32, the claims are met by the rejection of claims 9-10 and 12, as described above

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiries

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jun Fei Zhong whose telephone number is 571-270-1708. The examiner can normally be reached on Mon-Fri, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on 571-272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JFZ
5/23/2008
/Vivek Srivastava/

Supervisory Patent Examiner, Art Unit 2623